entists than non-scientists. The book would have benefited from an international discussion on how we can better quantify our planet's biodiversity. The occasional strong chapters make this fairly expensive book an intellectual bargain. However, it is painfully clear from May's challenge in the introduction that far more work is needed to gather and link local, regional, and global information on biodiversity in the face of our planet's sixth wave of extinction.

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Molecular Genetic Approaches in Conservation. Edited by Thomas B. Smith and Robert K. Wayne. 1996. Oxford University Press, New York. 483 pages. $70.00. ISBN 0-19-509526-X.

The first question a *Madroño* reader is likely to ask about this book is "how many of the 28 chapters are relevant to plant conservation?" The short answer: "disappointingly few." However, hidden in the zoocentric majority, a minority of chapters focus entirely on plants (three to be exact), and several contain material of broad general interest. Although in principle plant and animal conservation biology have much in common, an important distinction arises in molecular genetics: the suitability and availability of polymorphic markers. Most of the conservation genetic methods and case studies presented here exploit the rapidly evolving mitochondrial genome or hypervariable microsatellite markers of animals. These polymorphic and well-characterized markers are extremely informative in measuring diversity and reconstructing population history in animals. In contrast, the mitochondrial genome of plants is slowly evolving and relatively poorly characterized, and therefore difficult to exploit at the levels of interest to conservation biologists. Likewise microsatellite loci, which are already well-characterized in the nuclear genome of many animal species, have been slow to enter the toolbox of plant conservation geneticists. (Microsatellites possess many alleles at each locus and are therefore more powerful in population genetic analyses than dominantly inherited random amplified polymorphic DNA (RAPD), a popular method in plant studies.)

The opening chapter, "An Overview of the Issues", reviews the hierarchical levels (from individual to ecosystem!) at which molecular genetic tools have been applied in conservation biology. Foreshadowing the zoocentricity of subsequent chapters, no botanical examples are given. The next eighteen "methods" chapters cover a variety of techniques, but many of these are not readily transferable to plants due to their reliance on mitochondrial DNA or well-characterized nuclear loci. The chapter on RAPD markers in conservation genetics by Peter Fritsch and Loren Rieseberg is perhaps of the broadest applicability in the book. In fact, it contains the book's only reference to fungi. The well-characterized organellar genome of plants, chloroplast DNA (cpDNA), is the subject of two chapters. Although cpDNA can be effectively used to resolve species-level relationships, it is rarely variable enough to confidently resolve population phylogenies, as is routine for animal mitochondrial DNA. The cpDNA chapters cover traditional restriction site methods and DNA sequencing, respectively. Unfortunately, some of the more innovative applications of PCR to the chloroplast genome (e.g., single-strand conformational polymorphisms and chloroplast simple sequence repeats) are not included. These promising methods do have the potential to resolve population relationships, the hierarchical level of greatest interest in most conservation genetics studies.

The methods section is followed by three "analysis" chapters. They provide good introductions to the issues of estimating effective population size and migration, modeling genetic bottlenecks, and the problems associated with quantifying relatedness from molecular genetic data. All three are based primarily on data from mitochondrial

DNA and/or microsatellites. Most of the above chapters include descriptions of applications of the methods. These many examples provide a good overview of modern conservation genetics. The five following chapters provide additional case studies, covering a variety of vertebrates and one plant, the Pacific yew, *Taxus brevifolia.*

The volume concludes with an excellent and nicely balanced "perspective" chapter by Philip Hedrick. Hedrick reminds us that "many of the critical factors that appear to cause extinctions are not genetic ones" and highlights neglected applications of molecular genetic approaches (e.g., studying loci of adaptive significance). His perspective on the role of molecular genetic data as a complement to ecological and morphological studies in conservation biology is commendable. My overall reaction to the book is that it would be wonderful to see a parallel volume focusing primarily on conservation genetics of plants and fungi. A large amount of excellent work is being done in this area, but all too little of it will be found here.

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Volume 44, Number 3, pages 223–310, published 20 April 1998